

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1.-25. (Canceled)
26. (New) A method for processing a received signal, the method comprising:
selecting a signal constellation, at a communication device, based on a channel state information;
receiving a modulated signal at a receiver of the communication device; and
demodulating the modulated signal at a detector module of the communication device
by selecting a point from the selected signal constellation corresponding to the modulated signal.
27. (New) The method of claim 26, wherein the signal constellation is further selected based on a signal to noise ratio.
28. (New) The method of claim 26, wherein modulated signal is received by multiple receive antennas.
29. (New) The method of claim 26, further comprising decoding the demodulated signal using an outer code that includes codes over a plurality of signal matrices across time.
30. (New) The method of claim 26, further comprising transmitting an indication of a current signal to noise ratio from the communication device to a second communication device.
31. (New) The method of claim 26, further comprising storing a plurality of signal constellations in a memory of the communication device.
32. (New) The method of claim 26, wherein the signal constellation is designed based on a minimum Kullback-Leibler distance between signal constellation points.
33. (New) The method of claim 26, wherein demodulating the modulated signal comprises performing maximum likelihood demodulation.

34. (New) The method of claim 26, wherein the demodulating the modulated signal comprises performing coherent demodulation.

35. (New) A network element comprising:
a receiver module corresponding to an antenna, wherein the receiver module is configured to receive a modulated signal from a second network element; and
a detector module configured to select a signal constellation based on a channel state information and to demodulate the modulated signal by selecting a point from the signal constellation corresponding to the modulated signal.

36. (New) The network element of claim 35, the detector module is further configured to select the signal constellation based on a signal to noise ratio.

37. (New) The network element of claim 35, further comprising multiple receiver modules corresponding to multiple receive antennas, wherein the multiple receiver modules are configured to receive the modulated signal.

38. (New) The network element of claim 35, wherein the detector module is further configured to produce a demodulated signal by demodulating the modulated signal; and to decode the demodulated signal using an outer code that includes codes over several signal matrices across time.

39. (New) The network element of claim 35, further comprising a transmit module configured to transmit an indication of a current signal to noise ratio.

40. (New) The network element of claim 35, further comprising a memory configured to store the signal constellation in a look-up table.

41. (New) The network element of claim 35, wherein the signal constellation is designed based on a largest minimum Kullback-Leibler distance between signal constellation points.

42. (New) The network element of claim 35, wherein the detector module is further configured to perform maximum likelihood demodulation.

43. (New) The network element of claim 35, wherein the detector module is further configured to perform coherent demodulation.

44. (New) The network element of claim 35, wherein the network element comprises part of a base station or a mobile station.

45. (New) The network element of claim 35, wherein the detector module is configured to receive the channel state information and the signal constellation.

46. (New) A network element comprising:
means for receiving a modulated signal from a second network element;
means for selecting a signal constellation based on a channel state information; and
means for demodulating the modulated signal by selecting a point from the signal constellation corresponding to the modulated signal.

47. (New) A detection module comprising:
an input component configured to receive a signal; and
a detection component configured to select a signal constellation based on a channel state information and to demodulate the modulated signal by selecting a point from the signal constellation corresponding to the modulated signal.

48. (New) The detection module of claim 47, wherein the input component is further configured to receive a channel estimate, a signal-to-noise ratio, and the signal constellation.

49. (New) A computer-readable medium having computer-readable instructions stored thereon that, when executed by a processor, cause a computing device to:
receive a modulated signal;
select a signal constellation based on a channel state information; and
demodulate the modulated signal by selecting a point from the signal constellation corresponding to the modulated signal.

50. (New) The computer-readable medium of claim 49, wherein the signal constellation is designed based on a largest minimum Kullback-Leibler distance between signal constellation points.

51. (New) A method for communicating a signal, the method comprising:
selecting a point from a signal constellation at a selection module based on a channel state information;
modulating the signal at a modulator using the selected point; and
transmitting the modulated signal from a first network element to a second network element.

52. (New) The method of claim 51, wherein selecting the point from the signal constellation is further based on a signal-to-noise ratio.

53. (New) A network element comprising:
a selection module configured to select a point from a signal constellation based on a channel state information;
a modulator configured to modulate the signal using the selected point; and
a transmitter configured to transmit the modulated signal to a second network element.